

ABSTRACT OF THE DISCLOSURE

It is an object of the present invention to record to and reproduce different types of optical disks using light beams with different wavelengths.

5 In an optical head device for recording to and reproducing high-density optical disks using an objective lens with a large NA, a sawtooth-shaped hologram is used for recording to and reproducing conventional optical disks such as DVDs. For blue light, a sawtooth height is the light path length 2λ , and second-order diffraction light is used. Red light generates first-order

10 diffraction. The hologram is blazed and has convex lens function, and corrects chromatic aberration of the refractive lens. A relay lens is disposed between an infrared laser light source and the objective lens, and the light beam that is emitted from the infrared laser light source is substantially converged by the relay lens, and then, as it diverges once again, it is incident

15 on the objective lens, which focuses the light beam into a spot on the recording surface of an optical disk after passing through an approximately 1.2 mm substrate.